

Board of Education Agenda Item

Item: _____ T. _____

Date: November 18, 2010

Topic: Report on the Virginia College and Career Readiness Initiative

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Origin:

Topic presented for information only (no board action required)

Board review required by

State or federal law or regulation

Board of Education regulation

Other: _____

Action requested at this meeting Action requested at future meeting: _____
(date)

Previous Review/Action:

No previous board review/action

Previous review/action

Date: January 14, 2010

Action: The Board of Education accepted a report for informational purposes.

Date: April 21, 2010

Action: The Board of Education received a report that described the progress and activities conducted by the Virginia Department of Education toward meeting the Board of Education objectives.

Background Information:

In January 2007, the Board of Education authorized the Virginia Department of Education (VDOE) to conduct studies of key indicators of college readiness that may be used to develop measures that identify students as likely prepared for postsecondary educational programs. Since that time, the Department has been engaged in several analytic efforts to identify indicators that suggest graduates are academically prepared for postsecondary educational success. The primary goal of the studies was to understand the associations between achievement as measured end-of-course Standards of Learning (SOL) assessments and postsecondary success. These studies included:

- Analysis of the association between SOL scores and Scholastic Aptitude Test (SAT) scores.
- Analysis of the association between SOL scores and postsecondary enrollment and persistence.
- Analysis of the association between SOL scores and postsecondary academic outcomes, including participation on postsecondary developmental coursework and course grades in postsecondary educational programs.

Through this research, VDOE has identified indicators of college readiness that are independently associated with a high probability of enrollment and persistence in four-year postsecondary institutions from across the country. The Virginia-specific indicators identified thus far are:

- Earning advanced proficient scores on mathematics, reading, and writing SOL assessments;
- Earning an advanced studies diploma;
- Participating in a college preparatory curriculum that includes Algebra II and chemistry; and
- Participating in the Virginia Early College Scholars program.

Other indicators of students' preparedness for credit-bearing courses in postsecondary education include:

- Participation in Advanced Placement, International Baccalaureate, and dual-enrollment courses; and
- Earning college ready scores on placement tests such as the SAT and ACT.

A detailed description of the research results is provided in Attachment A, Virginia's College and Career Readiness Initiative.

In January 2007, the Board of Education also authorized the Virginia Department of Education to request the College Board, ACT, and the American Diploma Project to conduct alignment studies of their respective college and career readiness standards with the *Standards of Learning* (SOL). All alignment studies found that Virginia's mathematics and English standards showed strong alignment with their respective postsecondary readiness standards. In 2009 and 2010, respectively, the Virginia Board of Education adopted revised SOL in mathematics and English that reflect the input and recommendations provided by the studies and substantial input from Virginia stakeholders.

In April 2010, the Board of Education received an update on progress towards meeting the Board objectives for postsecondary readiness including the major elements of the Virginia College and Career Readiness Initiative (CCRI).

Summary of Major Elements

Virginia has moved forward to conduct a variety of additional activities that focus on increasing the number of high school graduates who meet or exceed college and career readiness benchmarks. The initiative is continuously supported by research that is aimed at identifying, validating, and updating the state's understanding of the high school courses and achievement

levels that support students' preparation for success in entry-level, credit-bearing courses in college.

VDOE's CCRI research is currently focused on understanding the associations among outcomes in secondary and postsecondary education. The study that is underway relies on de-identified data from both VDOE and the State Council of Higher Education for Virginia (SCHEV) that follows individual students from high school and into public and private nonprofit colleges in Virginia. The data permit VDOE to link secondary outcomes of high school students, such as SOL test scores, diploma earned, attendance, and dual enrollment, to students' course placement in their first year of college, grades in mathematics and English courses, and persistence into their second year. The initial results support prior information learned from studies focused on enrollment in four year institutions, and provide more information about course enrollment for students enrolled in Virginia's two-year institutions of higher education—where the vast majority of developmental education is provided in Virginia.¹ Specifically, the initial² results of the studies of students who completed high school in 2008 and enrolled in either two- or four-year institutions of higher education in Virginia in the subsequent year show that:

- Nearly 60 percent of high school graduates and completers who enrolled in two-year institutions in Virginia after high school participated in developmental mathematics or English courses within one year, with a larger percentage of students enrolled in mathematics courses relative to English courses.
- Students who earned advanced studies diplomas had a low probability of enrolling in developmental education courses.³
 - Approximately 6 percent of students who graduated high school with an advanced studies diploma enrolled in developmental English courses.
 - Approximately 8 percent of students who earned advanced studies diplomas enrolled in developmental mathematics courses.
 - Approximately 11 percent of students who earned advanced studies diplomas enrolled in developmental courses in mathematics or English.
- Students who earned standard diplomas had comparatively higher rates of enrollment in developmental education courses. Of the students who earned standard diplomas:
 - Approximately 35 percent enrolled in developmental English courses.
 - Approximately 42 percent enrolled in developmental mathematics courses.
 - Approximately 54 percent enrolled in developmental courses in mathematics or English.
- Students who earned advanced proficient scores on the SOL assessments and earned advanced studies diplomas have the lowest rates of enrollment in developmental courses.

¹ Some four-year, private nonprofit institutions offer and enroll students in developmental courses.

²These studies are ongoing. Results presented here are the first available. Additional results and complete reports will be made available as they are completed.

³The results presented here are based on data from two- and four-year institutions. Relatively few students participate in developmental education in four-year colleges in Virginia; and those who do, attend private, nonprofit institutions.

- Approximately 3 percent of the students who achieved advanced proficient scores on their Algebra I SOL and earned an advanced studies diploma enrolled in a developmental mathematics course.
- Approximately 2 percent of students who scored advanced proficient on the Reading SOL and earned an advanced studies diploma enrolled in a developmental English course.
- Students who earned standard diplomas and scored advanced proficient on their SOL assessments also had low rates of enrollment in developmental education courses.
 - Approximately 14 percent of standard diploma earners who scored advanced proficient on the English reading assessment enrolled in developmental education courses.
 - Approximately 20 percent of standard diploma earners who scored advanced proficient in Algebra I enrolled in developmental education courses. This was a relatively small group of students in the data set, comprising only 647 students whose data were accurately matched between secondary and postsecondary data sets.
- Nearly all students (97 percent) who earned advanced proficient scores on the Algebra I SOL participated in Algebra II,⁴ and 85 percent of students who achieved a proficient score on the Algebra I assessment enrolled in Algebra II.

As part of the research, statistical models were developed to identify factors that predict, with a high degree of accuracy, the factors that impact the likelihood that students will enroll in developmental education courses. The following summarizes key results from the predictive analysis.

- Scoring advanced proficient on the Algebra I assessment was associated with a low likelihood of enrolling in developmental mathematics courses. The model predicts that 5 percent of students who earn advanced proficient (500 or above) on the Algebra I assessment will enroll in developmental education courses.
- Scoring advanced proficient on the English reading assessment was associated with a low chance of enrolling in developmental English courses. Statistically, 3.5 percent of students who scored in the advanced proficient range (500 or above) were expected to enroll in developmental English courses.
- Participation in Algebra II and Chemistry were statistically significant predictors of enrollment in credit-bearing versus developmental mathematics courses, with course participation further reducing the likelihood that students will participate in developmental education courses in college.
- Ten percent or less of students who participated in dual enrollment and Advanced Placement courses were enrolled in developmental education courses.

⁴This information uses test participation as a proxy for enrollment.

- Placement in developmental education courses varied systematically across two-year institutions in Virginia. Students with similar academic achievement as measured by SOL test outcomes and diploma type had different chances of participating in developmental courses depending on the institution in which they enrolled. Recognizing that current placement practices vary by institution, VDOE will work with representatives from the Virginia Community College System to better understand these results.

Moving forward, VDOE plans to continue examining interactions among student outcomes, and determine how other factors, such as whether students are economically disadvantaged, are English language learners, or have disabilities, are associated with postsecondary enrollment, placement, and course outcomes. VDOE will update the Board periodically as new information becomes available.

CCRI Development and Implementation

The Virginia Department of Education (VDOE) has worked in close collaboration with the Virginia Community College System (VCCS), and the State Council of Higher Education for Virginia (SCHEV) to fully develop and begin implementing the initiative. Through the continuing work on the initiative, Virginia is in the process of:

- 1) Defining college and career readiness performance expectations aligned to national and international college and career ready standards.
 - Using the Standards of Learning and other validated state and national college and career readiness standards, including the Common Core State Standards, department staff drafted a preliminary set of English and mathematics performance expectations for external review.
 - Faculty at two- and four-year institutions of higher education provided feedback about the importance of each of the draft college and career ready performance expectations via an online survey. With assistance from VCCS and SCHEV in recruitment, more than 100 respondents participated in each of the English and mathematics surveys.
 - English and mathematics consensus/review teams composed of two- and four-year higher education institution staff and secondary content area experts analyzed the data and made recommendations to the Department on which performance expectations reached the level of “important” or “critical” for college and career readiness.
 - The recommended *Virginia English College and Career Readiness Performance Expectations* and a correlation crosswalk between the expectations and the *Common Core State Standards, College and Career Readiness* are provided as Attachment B. Similar documents for mathematics are in preparation.
- 2) Developing elective “capstone courses” to support students who need additional instruction to meet college and career ready performance expectations before leaving high school.

- Department staff members are currently developing preliminary course descriptions, program objectives, sample teaching strategies, and delivery options to define the grade-12 capstone courses. Course codes have been identified.
 - The Department has requested support from the National High School Center and Appalachia Regional Comprehensive Center (ARCC)/Edvantia to identify specific content support materials for the capstone courses. The request is part of the ARCC's annual plan for services to Virginia, and is under review by the U.S. Department of Education.
 - The Department has surveyed school divisions to determine which ones are developing capstone-like support materials and course designs and which are interested in piloting capstone programs for the 2011-2012 school year.
- 3) Providing technical assistance and professional development to Virginia's educators to support implementation of the revised English and mathematics standards and the college and career ready performance expectations.
- The Department is in the process of negotiating pilot professional development centers at certain state universities to provide coursework and ongoing teacher support for the content on the performance expectations. This will be accomplished through federal teacher training funds. Part of this professional development process will be the development of sample capstone course materials so that teachers can teach secondary courses more effectively and be ready to teach the capstone courses when their divisions implement the programs.
 - The State Council of Higher Education for Virginia has agreed to support teacher professional development on the performance expectations through its next cycle of federal Title IIa grant awards to four-year institutions, funded by the *Elementary and Secondary Education Act*.
- 4) Aligning the state assessments to measure student mastery of the more rigorous mathematics and English standards adopted in 2009 and 2010. VDOE is developing certain high school end-of-course tests to support the establishment of a college ready scale score. When the Board establishes cut scores for these new tests, the Department anticipates proposing minimum cut scores that demonstrate proficiency to verify course credit, and minimum scores that represent academic preparedness for success in introductory, credit-bearing English and mathematics courses in college. The college ready achievement level will replace advanced proficiency on certain end-of-course tests.
- 5) Identifying accountability measures and incentives for schools to increase the percentage of students who graduate high school having demonstrated the academic and career skills needed to be successful in postsecondary education programs.
- The Department is in the process of identifying incentives for high schools to increase the number of students who graduate having demonstrated that they have met college and career ready performance expectations. The current Virginia Index of Performance (VIP) is already in place and provides an example of the types of incentives that can be used to increase achievement. The award gives significant weight towards increasing advanced proficient scores on SOL assessments, which supports the CCRI goals. Other incentives could be provided

through the VIP or similar recognition programs.

- The Department has started a crucial dialogue with its partners in the higher education community and policy makers to determine whether it is appropriate to provide additional incentives to schools that make gains in increasing students' preparation for college. As well, there might be incentives available directly to students who meet or exceed Virginia's CCR Performance Expectations, with a particular focus on student groups who have been underrepresented in postsecondary education and training programs. For example, SREB has recommended that Virginia's public postsecondary institutions adopt a policy that would permit direct enrollment in entry-level, credit-bearing college courses for students who meet or exceed the readiness performance standards on the eleventh-grade English reading and writing assessments and the Algebra II end-of-course assessment. The policy would exempt these students from additional placement or readiness testing, thereby reducing the costs and time associated with such testing. Further, this policy would afford more students the opportunity to earn credits towards college graduation.

Superintendent's Recommendation:

The Superintendent of Public Instruction recommends that the Board of Education accept the Report on the Virginia College and Career Readiness Initiative.

Impact on Resources:

The work to date has been completed with existing Department resources, including two federal statewide longitudinal data system grants and consulting staff support from the Southern Regional Education Board through a grant from the Bill and Melinda Gates Foundation. Funding for the SREB grant will end December 31, 2010. Additional responsibility related to this activity may affect other services.

Timetable for Further Review/Action:

The Department will update the Board of Education as related research is completed and additional components of Virginia's College and Career Readiness Initiative are developed.

Virginia's College and Career Readiness Initiative

In 1995, Virginia began a broad educational reform program that resulted in revised, rigorous content standards, the Virginia Standards of Learning (SOL), in the content areas of English, mathematics, science, and history and social science. These grade-by-grade and course-based standards were developed over 14 months with revision teams including K-12 teachers and administrators, higher education representatives, community and agency partners, and citizen groups. The four sets of standards were revised in two recent revision windows, 2001-2003 and again in 2008-2010, as required by legislation of the Virginia General Assembly. In addition to the standards in the four core subjects, Virginia has Standards of Learning for all of its content areas, including foreign languages, fine arts, health, physical education, driver education, and computer technology.

In January 2007, the Board of Education authorized the Virginia Department of Education to conduct studies to determine factors contributing to success in postsecondary education. As part of that effort, the Department of Education requested Achieve, the American Diploma Project (ADP), the College Board, and ACT to conduct studies comparing their respective standards for postsecondary readiness to the Virginia Standards of Learning in English/Reading and Mathematics. In 2009 and 2010, respectively, the Virginia Board of Education adopted revised Standards of Learning in mathematics and English. The revised standards reflect the substantial input and recommended changes provided by college faculty and other experts from the College Board, ACT, the American Diploma Project, and the business community. These groups support Virginia's revisions and have validated the standards as college and career ready.

The Virginia College and Career Readiness Initiative builds on the revised standards and is designed to:

- 1) Ensure that college and career ready learning standards in reading, writing, and mathematics are taught in every Virginia high school classroom; and
- 2) Strengthen students' preparation for college and the work force before leaving high school.

As part of the initiative, Virginia has been engaged in a research program designed to understand the associations between performance on Virginia's statewide assessments and enrollment and performance in postsecondary education. Through this research, VDOE has identified indicators of college readiness that are independently associated with a high probability of enrollment and persistence in four-year postsecondary institutions from across the country. The Virginia-specific indicators are:

- Participating in a college preparatory curriculum that includes Algebra II and chemistry.
- Earning advanced proficient scores on mathematics, reading, and writing SOL assessments.
- Earning an advanced studies diploma.

Other indicators of students' preparedness for credit-bearing courses in postsecondary education include:

- Participation in Advanced Placement, International Baccalaureate, and dual-enrollment courses.
- Participating in the Virginia Early College Scholars program.¹
- Earning college ready scores on placement tests such as the SAT and ACT.²

Building on this work, Virginia is moving forward to implement the revised English and mathematics Standards of Learning and to conduct a variety of activities that focus on increasing the number of high school graduates who meet or exceed college and career ready benchmarks. The Virginia Department of Education (VDOE) leads the initiative and works in close collaboration with leaders in the Virginia Community College System (VCCS) and the State Council of Higher Education for Virginia (SCHEV). Through the work in the initiative, Virginia is in the process of:

- 1) Defining college and career ready performance expectations aligned to national and international college and career ready standards;³
- 2) Developing elective "capstone courses" to support students who need additional instruction to meet college and career ready performance expectations before leaving high school;
- 3) Providing technical assistance and professional development to Virginia's educators to support implementation of the revised English and mathematics standards and the college and career ready performance expectations;
- 4) Aligning the state assessments to measure student mastery of the more rigorous mathematics and English standards adopted in 2009 and 2010. Certain high school end-of-course tests will include quantitative indicators of whether students have met or exceeded the achievement levels needed to be successful in introductory mathematics and English courses in college; and
- 5) Identifying accountability measures and incentives for schools to increase the percentage of students who graduate high school having demonstrated the academic and career skills needed to be successful in postsecondary education programs.

This document was developed to describe the Virginia College and Career Readiness Initiative and to provide results of research conducted thus far that inform the process. VDOE will provide updated information as it becomes available via the Web at: http://www.doe.virginia.gov/instruction/college_career_readiness/.

¹ The Early College Scholars program allows eligible high school students to earn at least 15 hours of transferable college credit while completing the requirements for an Advanced Studies Diploma or an Advanced Technical Diploma. More information is available at:

http://www.doe.virginia.gov/instruction/graduation/early_college_scholars/.

² The College Board and ACT have developed scores on their respective tests that represent the minimum required to have a high probability of success in the first year of college.

³ This work is supported by the Virginia's participation in the Southern Regional Education Board's college readiness initiative, funded by the Bill and Melinda Gates Foundation.



Why College and Career Ready?

America's students are facing increasing competition for meaningful employment from candidates around the world as more people in more countries are becoming more highly educated. At the same time, employers' expectations for the level of education and training needed for entry level jobs have increased. For example, Achieve reported that 35 years ago, only 12 percent of U.S. jobs required some postsecondary training or an associate's degree, and only 16 percent required a bachelor's degree or higher. Estimates suggest that in the next decade, nearly eight in 10 job openings will require postsecondary education or training⁴.

As a Commonwealth, increasing citizens' educational attainment levels will also lead to economic growth throughout the state—by increasing income and reducing the number of children living in poverty. Research conducted by VCCS shows that quarterly wages increased as a function of earning more college credit among students who left a VCCS college in 2007. Two years later, students who had earned 60 credits or more (or had graduated), earned on average approximately \$10,000 more per year than students who had earned fewer than 15 credit hours from Virginia's community colleges.⁵ Children whose parents do not have any college education are increasingly likely to be living in poverty as employer expectations for education increases. Research shows that between 1986 and 2006, the percent of children living in poverty has increased by 12 percent for children whose parents are employed full-time, have a high school diploma, but do not have any college education. During the same time period, there was nearly no change in the percent of children living in poverty for children of parents who had some college education.⁶

As we move through the second decade of the 21st century, the prospects for future generations' success will greatly improve if the Commonwealth succeeds in meeting Governor McDonnell's goal of increasing by 100,000 the cumulative number of associate's and bachelor's degrees earned in Virginia over the next 15 years. Virginia's College and Career Readiness Initiative can directly support the Governor's goal by increasing students' preparedness for postsecondary education and training—leading to more credits earned, more graduates, and stronger economic conditions throughout the Commonwealth.

Components of the College and Career Readiness Initiative

The Virginia CCRI is comprised of the five components noted above:

- 1) Defining college and career ready performance expectations aligned to national and international college and career ready standards;⁷
- 2) Developing elective “capstone courses” to support students who need additional instruction to meet college and career ready performance expectations before leaving high school;

⁴ <http://www.achieve.org/files/CollegeandCareerReady.pdf>

⁵ http://www.vccs.edu/Portals/0/ContentAreas/AcademicServices/StudentSuccess/StudentSuccessSnapshot_12PPT-02182010.pdf

⁶ Douglas-Hall, A. & Chau M. (2007). Parents' Low Education Leads to Low Income, Despite Full-Time Employment. National Center for Children in Poverty, Columbia University Mailman School of Public Health. http://www.nccp.org/publications/pub_786.html.

⁷ This work is supported by the Virginia's participation in the Southern Regional Education Board's college readiness initiative, funded by the Bill and Melinda Gates Foundation.



- 3) Providing technical assistance and professional development to Virginia’s educators to support implementation of the revised English and mathematics standards and the college and career ready performance expectations;
- 4) Aligning the state assessments to measure student mastery of the more rigorous mathematics and English standards adopted in 2009 and 2010. Certain high school end-of-course tests will include quantitative indicators of whether students have met or exceeded the achievement levels needed to be successful in introductory mathematics and English courses in college; and
- 5) Identifying accountability measures and incentives for schools to increase the percentage of students who graduate high school having demonstrated the academic skills needed to be successful in postsecondary education programs.

Defining Standards-Based College and Career Ready Performance Expectations

Virginia developed and implemented a standards-based school accountability system in the 1990s. The Virginia Standards of Learning describe the Commonwealth's expectations for student learning and achievement in grades K-12 in English, mathematics, science, history/social science, technology, the fine arts, foreign language, health and physical education, and driver education. Students are tested on mastery of the standards in four core content areas: English, mathematics, science, and history/social science. Assessment results are used to determine school accountability ratings, and in high school, the Board of Education has prescribed the number of tests in specific content areas that students must pass to earn standard and advanced studies diplomas.

In 2009 and 2010, respectively, the Virginia Board of Education approved revised Standards of Learning in mathematics and English. These updated standards were implemented following reviews and input from Achieve, the College Board, and ACT, all of which validated the revised standards as college and career ready. The CCRI extends this work to define, both qualitatively and quantitatively, the level of performance students must reach to be academically prepared to enter and successfully complete credit-bearing courses in English and mathematics in college.

Virginia has leveraged support available from SREB to develop standards-based college and career ready performance expectations in mathematics and English. The performance expectations are designed to define the content and level of achievement students must reach to be prepared for success in entry-level credit-bearing courses in mathematics and English. VDOE coordinates the development of the performance expectations, working closely with representatives from the higher education community.

To develop the *Virginia College and Career Ready (CCR) Performance Expectations*, Virginia’s educators are drawing from several sources of learning standards that have already been developed, vetted, and validated by educators and the business community:

- Virginia’s Standards of Learning in mathematics and English
- The Common Core State Standards (CCSS) developed through a national collaboration led by the Council of Chief State School Officers and the National Governors Association

- The Virginia Community College System’s learning goals and student outcomes⁸
- Career and Technical Education competencies
- Other standards identified as important or critical for success by faculty at Virginia’s two- and four-year colleges.

Using these standards, VDOE developed a survey to ask higher education faculty and other stakeholders to determine how important each expectation is to students’ college and career readiness. VDOE sent the survey to educators and other relevant stakeholders identified by VCCS, SCHEV, the career and technical education community, and high school educators. The results of the survey will be used by VDOE, VCCS, and SCHEV leaders to finalize the Virginia College and Career Ready (CCR) Performance Expectations.

The CCR Performance Expectations, when final, will identify the performance expectations from grades nine through twelve that are considered important or essential for students to master to be academically prepared to succeed in entry-level credit-bearing English and mathematics courses in college. The skills in English and mathematics would also support student success in college courses in other subject areas such as science and history. The expectations are being developed through a process that includes faculty from Virginia’s two- and four-year colleges and universities; members of the business community; and high school English and mathematics educators.

Virginia began developing the performance expectations in the spring of 2010, and plans to finalize the work during the 2010-2011 school year.

Virginia’s Capstone Courses in English and Mathematics

Virginia is working to establish quantitative measures that indicate whether a student has sufficiently mastered the college and career ready performance expectations such that they would have a high probability of enrolling and being successful in entry-level credit-bearing courses in college. For example, indicators such as outcomes on Virginia SOL assessments, SAT, and ACT tests would be available by the end of students’ junior year in high school. With these quantitative indicators, schools can identify students who have participated in a college-preparatory curriculum but have not met the achievement levels in English and mathematics needed to be successful in entry-level credit-bearing courses in postsecondary education.

VDOE is in the process of developing capstone courses that are focused on providing these students with the additional instruction they need to meet or exceed college and career ready performance expectations. The courses are being developed to provide students with applied and relevant instruction that supports students’ attainment of the rigorous CCR Performance Expectations. VDOE plans to work with at least two school divisions to develop course materials with the goal of piloting the capstone courses in the 2011-2012 school year.

Technical Assistance and Professional Development

A significant component of VDOE’s work is to provide technical assistance and professional development to Virginia’s educators to support implementation of the college and career ready

⁸ Available at: <http://www.lfcc.edu/files/documents/about/pie/assessment/VCCS-Gen-Ed-Goals-and-SLO---Approved-May-2006.pdf>.

performance expectations in Virginia’s high schools. For the CCRI to be successful, VDOE must be proactive in supporting school divisions’ ability to implement the revised SOL and to provide appropriate students with the capstone course experience. As part of the work to implement the revised SOL in mathematics and English,⁹ and the college and career ready performance expectations, VDOE and its partners will focus on providing professional development that enables teachers to have a better understanding of the knowledge and skills required for more students to meet or exceed the CCR Performance Expectations. This will be done by working with teachers and administrators to align and improve instruction so that it is focused on the CCR Performance Expectations, and those foundational standards that directly support college and career readiness. As well, VDOE will continue to support educators by providing ongoing technical assistance to ensure that high quality instruction is delivered to improve all students’ preparation for success in college and careers. VDOE will also work with its partners throughout the Commonwealth to identify opportunities for others—such as institutions of higher education and professional associations—to support the implementation of the CCRI.

Implementing More Rigorous Mathematics and English Standards and Defining Quantitative Indicators of College and Career Readiness

Virginia first implemented an assessment-based accountability system in 1998. The tests developed for this system were designed to assess student mastery of the content standards in English, mathematics, science, and history and social science. Passing scores were based on whether a student met the minimum level of achievement needed to pass the course or class associated with the Standards of Learning. Since that time, Virginia has revised the standards; with each revision, the tests were aligned to measure whether students demonstrated mastery of the revised content standards.

The most recent revision to Virginia’s mathematics and English SOL resulted in significant changes to the standards that increased the rigor of the content that students are expected to master. The revisions were completed following significant input from Achieve, the College Board, and ACT. These organizations reviewed the SOL and assessed how well they aligned to college and career ready standards of their respective organizations. With results from these alignment studies, the Virginia Board of Education adopted revised mathematics and English SOL (in 2009 and 2010, respectively) that are more rigorous than previous versions and are supported by Achieve, the College Board, and ACT as college and career ready.

With the adoption of these revised standards, VDOE is developing new tests that will measure students’ mastery of the more rigorous content standards. The new assessments will be administered online, and include technology-enhanced items that require students to demonstrate content mastery in ways that were not possible with multiple-choice tests. The result of the standards revision, therefore, will be that students will have to demonstrate mastery of more rigorous content in order to pass the revised SOL tests.

VDOE is developing the new tests to provide a college ready achievement level on certain end-of-course assessments in English and mathematics. The test development process will be

⁹ New tests that measure mastery of the revised mathematics and English SOL will be implemented in the 2012 and 2013 school years, respectively.

informed by previous research focused on the associations between student achievement measured by SOL assessments and postsecondary enrollment and persistence. Further, the results of a survey in which higher education faculty identified the SOL in mathematics and English that are essential for student success in introductory, credit-bearing English and mathematics courses in college will be considered in the test development process. In addition to adopting minimum cut scores that demonstrate proficiency to verify course credit, the Board of Education will adopt minimum scores that represent academic preparedness for success in introductory, credit-bearing English and mathematics courses in college. The college ready achievement level will replace advanced proficiency on certain end-of-course tests.

On the whole, this information will provide students, families, school counselors, and educators with a description of the level of preparation students need to be successful in postsecondary education and training programs. It will also provide student-level indicators of such achievement.

Continued Research on the Associations between Secondary Achievement and Postsecondary Outcomes

VDOE will continue to collaborate with VCCS and SCHEV on a research program designed to identify and validate quantitative indicators of postsecondary readiness and to understand the achievement levels and other factors that are associated with a high probability of:

- 1) Enrolling and persisting in four-year postsecondary institutions; and
- 2) Enrolling in and being successful in completing credit-bearing, nondevelopmental education courses in both two- and four-year colleges.

Beginning with the high school graduating class of 2006, Virginia has the ability to link data from students' postsecondary experiences to their enrollment in institutions of higher education across the country using data acquired from the National Student Clearinghouse. Having this link has allowed VDOE to conduct extensive analyses of the associations between high school indicators and postsecondary enrollment. In Virginia's institutions of higher education, approximately 45 percent of students who attend two-year schools enroll in one or more developmental (non-credit bearing) courses; in four-year schools, approximately three percent of students require developmental education before enrolling in credit-bearing courses.¹⁰ As well, the State Council of Higher Education for Virginia (SCHEV) indicates that in four-year schools, students who persist into their second year of college are associated with a high probability of graduating.¹¹

With this knowledge, VDOE has conducted analyses of the postsecondary enrollment data with the assumption that students who enroll in four-year schools and persist into their second year are prepared for success in college. Appendix A provides a summary of research conducted thus far, much of which was conducted by the Center for Assessment, Evaluation, and Educational Programming at Virginia Tech on behalf of VDOE. Key findings suggest the following:

¹⁰ In Virginia, the community colleges are expected to provide developmental coursework.

¹¹ State Council of Higher Education for Virginia. (2009). The four-year college pipeline in Virginia. Presentation to the Virginia P-16 Council, October 6, 2009, Richmond, VA.

- Students who earn advanced proficient scores on Virginia’s end-of-course mathematics and English SOL assessments have a high probability of enrolling in four-year colleges and persisting into their second year, with students who earn advanced proficient in reading, writing, and Algebra II having the highest probability of success.
- Students who score proficient on reading, writing, and mathematics end-of-course assessments have a relatively low probability of enrolling and succeeding in four-year institutions. These students’ probability for success in two-year institutions requires further study.
- Students who earn advanced studies diplomas in Virginia, including International Baccalaureate (IB) diplomas, have a high probability of enrolling in four-year colleges and persisting into their second year. Students who earn other diplomas have a low probability of enrolling in four-year institutions. These students’ degree of preparation for success in two-year institutions requires further study.
- Students who participated in Virginia’s Early College Scholar Program¹² had high rates of enrollment (greater than 85 percent) in four-year institutions within three years of graduating from high school.
- Consistent with national trends, significant work must be done in Virginia to support particular groups of students to enroll and be successful in postsecondary education. Of particular note are students who are economically disadvantaged, male, Hispanic, or African American. VDOE’s analysis showed that students in these groups generally have lower rates of enrollment and persistence. This was true even when their state assessment results suggest they were well prepared.
- Enrollment in two- and four-year colleges varies by Virginia’s Superintendents’ Regions, with northern Virginia enrolling the largest percent of students in two- and four-year colleges (see Appendix for details).

Starting with the high school graduating class of 2008, VDOE and SCHEV have the technical capability to link de-identified student-level records across state agencies, and analyses of these data are underway. The first analyses available will estimate the associations between secondary outcomes and course enrollment and grades in postsecondary education programs in Virginia. The initial analyses are focused on identifying outcomes and course-taking patterns that are associated with:

- 1) Participation in nondevelopmental coursework in postsecondary institutions, including in the Virginia Community College System;
- 2) Student attainment of a grade of C or better in credit-bearing, entry-level coursework; and
- 3) Student persistence into the second year of college.

¹² The Early College Scholars program allows eligible high school students to earn at least 15 hours of transferable college credit while completing the requirements for an Advanced Studies Diploma or an Advanced Technical Diploma. More information is available at: http://www.doe.virginia.gov/instruction/graduation/early_college_scholars.

Incentives for Schools to Increase College and Career Ready Preparation

VDOE is interested in identifying incentives for high schools to increase the number of students who graduate having demonstrated that they have met college and career ready performance expectations. The current Virginia Index of Performance (VIP) is already in place and provides an example of the types of incentives that can be used to increase achievement. The VIP program recognizes schools and school divisions that have made significant progress towards achieving specific measurable goals and objectives established by the Board of Education. The award gives significant weight towards increasing advanced proficient scores on SOL assessments, which supports the CCRI goals. Other incentives could be provided through the VIP or similar recognition programs.

VDOE considers it critical to work with its partners in the higher education community and policy makers to determine whether it is appropriate to provide additional incentives to schools that make gains in increasing students' preparation for college. As well, there might be incentives available directly to students who meet or exceed Virginia's CCR Performance Expectations, with a particular focus on student groups who have been underrepresented in postsecondary education and training programs. For example, SREB has recommended that Virginia's public postsecondary institutions adopt a policy that would permit direct enrollment in credit-bearing college courses for students who meet or exceed the readiness performance standards on the eleventh-grade English reading and writing assessments and the Algebra II end-of-course assessment. The policy would exempt these students from additional placement or readiness testing, thereby reducing the costs and time associated with such testing. Further, this policy would afford more students the opportunity to earn credits towards college graduation.

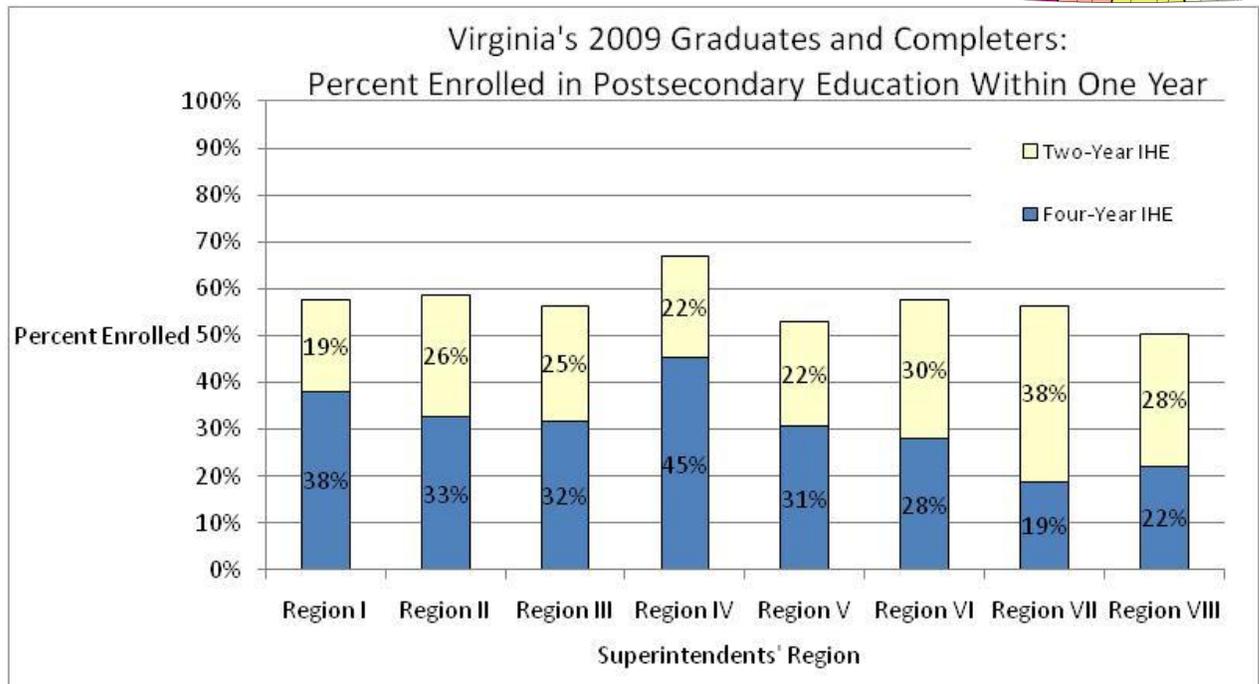
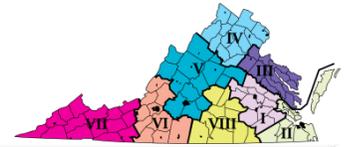
Appendix: Associations Between Student Achievement and Postsecondary Enrollment in Virginia: Highlights of Recent Analyses

From June 2009-June 2010, the Center for Assessment, Evaluation, and Educational Programming at Virginia Tech studied the associations between academic indicators available from the VDOE and postsecondary enrollment as documented by data from the National Student Clearinghouse. Data were analyzed from students who graduated high school or earned other completion credentials in the 2005-2006 and 2006-2007 school years. Postsecondary enrollment data were available through February 2009. The project resulted in two technical reports that focus on: 1) factors associated with initial enrollment in postsecondary institutions, and 2) the utility of the SOL assessments in predicting postsecondary enrollment. These detailed reports are available at: http://www.doe.virginia.gov/instruction/college_career_readiness/.

Taken together with the knowledge that approximately 3 percent of students in Virginia's four-year institutions participate in developmental education classes, whereas nearly half of students enrolling in Virginia community colleges participate in developmental education, the results of this study, with a few additional results from work conducted by VDOE, suggest that:

- Students who earn advanced proficient scores on Virginia's mathematics and English SOL assessments have a high probability of enrolling in four-year colleges and persisting into their second year, with students who earn advanced proficient in reading, writing, and Algebra II having the highest probability of success.
- Students who score proficient on reading, writing, and mathematics end-of-course assessments have a relatively low probability of enrolling and succeeding in four-year institutions. These students' probability of success in two-year institutions requires further study.
- Students who earn advanced studies diplomas in Virginia, including International Baccalaureate (IB) diplomas, have a high probability of enrolling in four-year colleges and persisting into their second year. Students who earn other diplomas have a low probability of enrolling in four-year institutions. These students' degree of preparation for success in two-year institutions requires further study.
- Students who participated in Virginia's Early College Scholar Program had high rates of enrollment (greater than 80 percent) in four-year institutions within three years of graduating from high school.
- Significant work must be done to support particular groups of students to enroll and be successful in postsecondary education. Of particular note are students who are economically disadvantaged, male, Hispanic, or African American. Students in these groups generally have lower rates of enrollment and persistence. This is true even when their state assessment results suggest they are well prepared.

- Enrollment in two-year and four-year colleges varies by Virginia's Superintendents' Regions, as shown in the map below.



The following summarizes analytic results from the studies conducted by researchers at Virginia Tech as well as results of some additional analyses conducted by VDOE.

Initial Enrollment in Four-Year Institutions

- Of the 77,458 high school graduates in the 2006 cohort, 29,216 or 37.7 percent were enrolled at a four-year institution in the fall of academic year 2006-2007.
- Approximately 68 percent of students who earned advanced studies diplomas and nearly 89 percent of students who earned International Baccalaureate (IB) diplomas enrolled in four-year institutions after graduating, suggesting that these credentials are associated with high probability of enrollment and persistence in four-year institutions.
- More than 85 percent of students who graduated in 2006 or 2007 and participated in Virginia's Early College Scholars program were enrolled in four-year institutions by the spring of 2009.
- Approximately 13 percent of students who earned standard diplomas enrolled in four-year institutions; students who earned other credentials had small chances of enrolling in four-year schools. This suggests that these credentials are not adequately preparing students for enrollment and success in four-year institutions.
- The average SOL scores for each of the SOL subject areas were higher for those enrolling in four-year institutions in the fall of 2006 than those who did not enroll.

- 6) Those scoring in the advanced proficiency category in each SOL subject area had the highest predicted and actual rates of enrollment.
- 7) A statistical model that used SOL proficiency levels to predict enrollment in four-year institutions for all subject areas correctly classified students into enrolled and non-enrolled categories 76.5 percent of the time.

Disadvantaged Student Status, Gender, Race, and Initial Four-Year Enrollment

- 1) Students who were not classified as economically disadvantaged enrolled at higher rates than students who were classified as economically disadvantaged.
- 2) Females enrolled at higher rates than males for all groups except American Indians and those who did not specify race.
- 3) In considering students of different race/ethnicity, Asians and American Indians had the highest rates of enrollment followed by those who did not specify their race and whites. Hispanics had the lowest rate of initial enrollment at four-year institutions.
- 4) African-Americans and American Indians enrolled at four-year institutions at higher rates than predicted based on statistical models that used student outcomes on SOL tests to predict enrollment; all other groups enrolled at rates lower than predicted.

Persistence in Four-Year Institutions

- 1) Among those enrolling at four-year institutions, 87.4 percent persisted to fall 2007. Eighty percent of those initially enrolling persisted to the fall of 2008.
- 2) Statistical models use SOL outcomes were not effective in predicting persistence in four-year institutions. Other factors should be investigated to better understand persistence.

Disadvantaged Student Status, Gender, Race, and Persistence in Four-Year Institutions

- 1) Economically disadvantaged students were less likely to persist than those students who were not economically disadvantaged.
- 2) Females were more likely to persist than males.
- 3) In considering students of different race/ethnicity, Asians had the highest persistence rates going from the second to third years; African Americans had the lowest persistence rates.
- 4) Across racial groups, males who were economically disadvantaged had persistence rates lower than their economically disadvantaged female counterparts. However, the difference between economically disadvantaged males and females is minimal in two racial groups (Asians and Hispanics).

Initial Enrollment in Two-Year Institutions

- 1) Of the 77,458 high school graduates in the 2006 cohort, 15,678 or 20.2 percent were enrolled at a two-year institution in either the summer or fall immediately following high school graduation, and approximately 59 percent of these students had earned standard diplomas and 36 percent had earned advanced diplomas in high school. The remaining five percent earned other credentials in high school.
- 2) The average SOL scores for each of the SOL-tested subject areas were *lower* for those enrolling in two-year institutions in the fall of 2006 compared to those who enrolled in four-year institutions but *higher* on average than the scores of those not attending any postsecondary institution.
- 3) Of Virginia's major racial and ethnic subgroups, Asian, Hispanic, and white students had similar enrollment rates at two-year colleges of 22.8, 22.8, and 21.0 percent, respectively. African Americans had the lowest enrollment rate of 16.8 percent.
- 4) Students who were economically disadvantaged enrolled at similar rates to those who were not economically disadvantaged. However, among Asians, those who were economically disadvantaged enrolled in two-year institutions at substantially higher rates than those who were not economically disadvantaged.
- 5) Overall, female enrollment was only slightly higher than male enrollment in two-year institutions (20.3 percent versus 20.1 percent). For Asians who were economically disadvantaged, male enrollment exceeded female enrollment (33 percent versus 29.5 percent). This may be explained in part by the higher enrollment of Asian females in four-year institutions.

Transferring to a Four-Year Institution

- 1) Of the 15,375 students from the 2006 cohort enrolling at a two-year institution initially, 19.3 percent transferred to a four-year institution.
- 2) The average SOL scores for each of the SOL-tested areas were higher for those transferring to four-year institutions compared to those who did not transfer.
- 3) Those who were economically disadvantaged transferred at a lower rate than those who were not; females transferred at a higher rate than males for most racial and ethnic groups. The exceptions were for economically disadvantaged African Americans and Whites.
- 4) The ethnic group with the highest transfer rate was the group whose members did not specify their race; Asians were the group with the next highest transfer rate. African Americans and Hispanics had the lowest transfer rate to four-year institutions.
- 5) In considering race, gender, and economic status together, Asian females who were not economically disadvantaged transferred at the highest rate. Hispanic males who were economically disadvantaged transferred at the lowest rate.

Degree or Certificate Attainment in Two-Year Institutions

- 1) Of the 15,375 students from the 2006 cohort enrolling at a two-year institution initially, 10.5 percent earned a degree or certificate.
- 2) The average SOL scores for each of the SOL-tested subject areas were higher for those earning a degree or certificate compared to those who did not earn a degree or certificate.
- 3) Those who were economically disadvantaged attained a degree or certificate at a lower rate than those who were not; females earned degrees or certificates at a higher rate than males except in the case of economically disadvantaged African Americans.

Two-Year Success

- 1) Of the 48,242 students from the 2006 cohort enrolling at a two-year institution initially, 23.3 percent met a criterion for success. These students either earned a certificate or degree or transferred to a four-year institution before the end of the study period, three years.
- 2) Those who were economically disadvantaged were less successful than economically advantaged students.
- 3) The ethnic group with the highest rate of success was the group that did not specify their race.
- 4) In considering race and gender the group with the highest success rate was females who did not specify their race.
- 5) The group with the highest success rate when considering race, gender, and economically disadvantaged status were Asian females who were economically advantaged.

College Enrollment and Persistence Patterns of Advanced Proficient Students in Language Arts and Mathematics

- 1) The group achieving advanced proficiency in English and in Algebra II had the highest rate of four-year enrollment (81.9 percent).
- 2) The group failing to achieve advanced proficiency in English and mathematics had the lowest rate of four-year enrollment (22.5 percent).
- 3) Those achieving advanced proficiency in English and Algebra II had the highest persistence rates in both 2007 and 2008, 94.8 percent and 90.9 percent respectively.
- 4) Those failing to achieve advanced proficiency in English and mathematics had the lowest persistence rates in both 2007 and 2008, 81.9 percent and 72.2 percent respectively.